CLAIMS:

1. A method of group creation for a pair of an unmanned aerial vehicle (UAV) and an unmanned aerial vehicle-controller (UAV-C) in a service enabler architecture layer (SEAL) architecture, the method comprising:

determining, by an unmanned aerial system application enabler (UAE) server, the pair of the UAV and the UAV-C in the SEAL architecture;

transmitting , by the UAE server, a group creation request for the pair of the UAV and the UAV-C to a SEAL group management (GM) server of the SEAL architecture;

receiving a first response message, by the UAE server, from the SEAL GM server in response to the group creation request;

creating a group including the pair of the UAV and the UAV-C based on the first response message, the group being used for quality-of-service (QOS) management;

establishing direct command and control (C2) communication for the pair of the UAV and the UAV-C using an initially allocated network QoS setup, the UAV and the UAV-C being registered to a network;

monitoring, by the UAE server, a current network condition of the pair of the UAV and the UAV-C based on feedback information from the pair of the UAV and the UAV-C;

when the direct C2 communication fails to meet a pre-defined QoS requirement, transmitting, by the UAE server, a QoS adaption request to a SEAL network resource management (NRM) server; and

receiving, by the UAE server, from the SEAL NRM server an updated QoS requirement,

wherein the feedback information of the pair of the UAV and the UAV-C includes: a group identity (ID) assigned to the pair of the UAV and the UAV-C, and a network resource requirement indicating required C2 communication resources.

2. The method of claim 1, wherein the group creation request further comprises a civil aviation authority (CAA)-level identity of the UAV.

3. The method of claim 1, wherein the group creation request further comprises:

a timeout period that defines a waiting time limit to wait for the first response message from the SEAL GM server after the group creation request is transmitted to the SEAL GM server.

4. The method of claim 3, the method further comprising:

transmitting another group creation request when the first response message is not assigned to the UAV server within the timeout period.

5. The method of claim 1, wherein the first response message further comprises a group creation result that indicates whether the group is successfully created for the pair of the UAV and the UAV-C.

6. The method of claim 5, wherein in response to the group creation result indicating that the group is successfully created for the pair of the UAV and the UAV-C, the first response message includes a group identity (ID) that is assigned to the pair of UAV and UAV-C.

7. The method of claim 5, wherein in response to the group creation result indicating that the group is successfully created for the pair of UAV and UAV-C, the first response message includes a plurality of subgroup IDs associated with the pair of UAV and UAV-C.

8. The method of claim 6, further comprising:

performing, by the UAE server, the QoS management for the pair of UAV and UAV-C based on the assigned group ID.

9. The method of claim 1, wherein the monitoring further comprises:

monitoring, by the UAE server, the current network condition of the pair of UAV and UAV-C based on the one of the group ID and a subgroup ID assigned to the pair of the UAV and the UAV-C.

10. The method of claim 1, further comprising: adjusting the C2 communication for the pair of the UAV and the UAV-C based on the updated QoS requirement.

11. The method of claim 1, further comprising: in response to receiving the feedback information of the pair of the UAV and the UAV-C for the current network condition, providing a second response message, by the UAE server, to the pair of the UAV and the UAV-C, the second response message including a QoS result that indicates whether the direct C2 communication of the pair of the UAV and the UAV-C meet the pre-defined QoS requirement.

12. An apparatus, comprising:

processing circuitry configured to:

determine a pair of an unmanned aerial vehicle (UAV) and an unmanned aerial vehicle-controller (UAV-C) in a service enabler architecture layer (SEAL) architecture;

transmit a group creation request for the pair of the UAV and the UAV-C to a SEAL group management (GM) server of the SEAL architecture;

receive a first response message from the SEAL GM server in response to the group creation request; create a group including the pair of the UAV and the UAV-C based on the first response message, wherein the group is used for quality-of-service (QOS) management;

establish direct command and control (C2) communication for the pair of the UAV and the UAV-C using an initially allocated network QoS setup, the UAV and the UAV-C being registered to a network;

monitor a current network condition of the pair of the UAV and the UAV-C based on feedback information from the pair of the UAV and the UAV-C;

when the direct C2 communication fails to meet a pre-defined QoS requirement, transmit a QoS adaption request to a SEAL network resource management (NRM) server; and

receive from the SEAL NRM server an updated QoS requirement,

wherein the feedback information of the pair of the UAV and the UAV-C includes: a group identity (ID) assigned to the pair of the UAV and the UAV-C, and a network resource requirement indicating required C2 communication resources.

13. The apparatus of claim 12, wherein the group creation request further comprises a civil aviation authority (CAA)-level identity of the UAV.

14. The apparatus of claim 12, wherein the group creation request further comprises:

a timeout period that defines a waiting time limit to wait for the first response message from the SEAL GM server after the group creation request is transmitted to the SEAL GM server.

15. The apparatus of claim 12, wherein the first response message further comprises a group creation result that indicates whether the group is successfully created for the pair of the UAV and the UAV-C.

16. The apparatus of claim 15, wherein in response to the group creation result indicating that the group is successfully created for the pair of the UAV and the UAV-C, the first response message includes the group identity (ID) that is assigned to the pair of the UAV and the UAV-C.

17. The apparatus of claim 16, wherein the processing circuitry is further configured to: perform, by an unmanned aerial system application enabler (UAE) server, the QoS management for the pair of the UAV and the UAV-C based on the assigned group ID.

18. The apparatus of claim 13, wherein the processing circuitry is further configured to:

in response to receiving the feedback information of the pair of the UAV and the UAV-C for the current network condition, provide a second response message to the pair of the UAV and

the UAV-C, the second response message including a QoS result that indicates whether the direct C2 communication of the pair of the UAV and the UAV-C meet the pre-defined QoS requirement.

19. Computer-readable storage medium, storing computer-readable instructions executable by a processor to carry out the method of any one of claims 1 to 11.